Electrical and Computer Engineering Technology (ECET)

Program Handbook

COMPUTER SCIENCE PROGRAMS

Computer Systems Technician – Network Systems

Computer Systems Technology – Network Engineering & Security Analyst

Computer Systems Technician – Software Support

Computer Systems Technology – Software Development

ELECTROTECHNOLOGY PROGRAMS

Computer Engineering Technology

Electrical Engineering Technology – Control

Energy Systems Engineering Technology

2013 INTAKE

Electrical and Computer Engineering Technology Program Handbook

Computer Systems Technician
– Network Systems Diploma

Computer Systems Technology
– Network Engineering & Security Analyst Diploma

Computer Systems Technician
– Software Support Diploma

Computer Systems Technology
– Software Development Diploma

Computer Engineering Technology Diploma

Electrical Engineering Technology – Control Diploma

Energy Systems Engineering Technology Diploma

This handbook is printed to provide guidance and information for students and employers. Every effort is made to keep this handbook accurate and timely. Prospective students and employers should however, check with the School of Electrical and Computer Engineering Technology (905) 575-2145 for details regarding admission requirements, enrolment limitations, co-operative education, and the program of studies for the various programs offered by the school. For more information visit our website at www.mohawkcollege.ca

Information Contacts

For general information about -	
Mohawk College	(905) 575-1212
Admissions	
Post-Secondary	ext 2415
Continuing Education	ext 3429
Counseling Department	ext 2211
Financial Aid & Awards	ext 2133
Mohawk Job Centre	ext 2167
Cooperative Education	ext 2167
Student & Graduate Employment Services	ext 2167

For specific information about -

Computer Systems Technician /Technology – Software Support / Development
Ms. Sharon Scollard (905) 575-1212 ext 3684

Computer Systems Technician /Technology – Network Systems / NESA
Mr. Martin Weddum (905) 575-1212 ext 3582

Computer Engineering Technology
Mr. Vijay Khatri - Semester 1, 2 and 3 (905) 575-1212 ext 3572
Mr. Sabu Joseph – Semester 4, 5 and 6 (905) 575-1212 ext 3172

Electrical Engineering Technology - Control
Mr. Vijay Khatri - Semester 1, 2 and 3 (905) 575-1212 ext 3572
Mr. Sabu Joseph – Semester 4, 5 and 6 (905) 575-1212 ext 3172

Energy Systems Engineering Technology
Mr. Vijay Khatri - Semester 1, 2 and 3 (905) 575-1212 ext 3572
Mr. Sabu Joseph – Semester 4, 5 and 6 (905) 575-1212 ext 3172

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MOHAWK COLLEGE OF APPLIED ARTS AND TECHNOLOGY

Mohawk College has grown to be one of the great Canadian community colleges. It began with the establishment of the Provincial Institute of Textiles (PIT) in 1947, which in turn became the Hamilton Institute of Technology (HIT) in 1957. Ten years later, in 1967, the HIT was incorporate as the newly established Mohawk College of Applied Arts and Technology. The College supports campuses and education centres in Brantford, Hamilton, and Stoney Creek.

A great variety of full-time, post-secondary certificate and diploma programs together with a wide range of part-time courses and programs, leading to either a certificate or college diploma, are possible in the following areas:

Business
Continuing Education
Engineering Technology
Health Sciences
Human Services
Interdisciplinary Studies
Media, Graphics & Communication
Skilled Trades and Apprenticeships

Many of the programs are co-operative in nature, offering students the opportunity to experience the real workplace environment and gain valuable on-the-job training. The college also has many partnerships in training and technology to make us more valuable to the students and the community at large.

Mohawk College serves the communities throughout Southern Ontario, offering over 100 full-time programs and more than 1,000 Continuing education courses. There are currently 10,000 full-time post-secondary students enrolled at Mohawk College and 40,000 continuing education students. Mohawk College is the largest in-school apprenticeship trainer in the province, with more than 3,000 apprentices registered in skilled trades programs. There are close to 800 full-time employees, including over 400 faculty, and an alumni association of more than 72,000 members. There is also a 342 bed on-campus student residence.

The Accessible Learning Services staff develops ways to eliminate barriers and facilitates access for students at all campuses that may have learning or physical disability, visual or hearing impairment, mobility impairment, or other disability. Student self-identification well in advance of course or program start-up is required to effectively evaluate, plan, co-ordinate, and implement support service. For more information please contact the Accessible Learning Services.

Make Mohawk College your choice…and if you're not sure, ask a graduate!

Visit the College's website at *www.mohawkcollege.ca*.

SCHOOL OF ELECTRICAL & COMPUTER ENGINEERING TECHNOLOGY

The School of Electrical and Computer Sciences (ECET) is a part of the Faculty of Engineering Technology at Mohawk College. We offer full-time post-secondary diploma and certificate programs in various disciplines.

COMPUTER SYSTEMS TECHNICIAN – NETWORK SYSTEMS - Students will gain expert knowledge of networks and connectivity and develop excellent communication, problem-solving and teamwork skills. The program provides students with the opportunity to experience: desktop virtualization, providing user support and troubleshooting, installing and configuring computer operating systems, server operating systems and services.

COMPUTER SYSTEMS TECHNOLOGY – NETWORK ENGINEERING AND SECURITY ANALYST - Students will gain expert knowledge of networks and connectivity and develop excellent communication, problem-solving and teamwork skills. The Computer Systems Technology - NESA program gives students the opportunity to excel in: network connectivity, virtual infrastructure. Students will explore topics such as: Scripting for system administration, security auditing and computer forensics, and cloud computing technologies.

COMPUTER SYSTEMS TECHNICIAN– SOFTWARE SUPPORT - Students in the program will gain experience and knowledge in a broad range of computer applications, databases and software tools. Computer Systems Technician - Software Support students will explore: project planning, technical writing, programming languages, and web design.

COMPUTER SYSTEMS TECHNOLOGY – SOFTWARE DEVELOPMENT - Students in the program will gain experience with a broad range of application development and computer systems. Students have the opportunity to complete a Specialist Designation in: web applications, enterprise applications, and health Informatics. Students will study topics such as: programming languages, database development, web tools, database design, system/business analysis, e-commerce, project management and enterprise technologies.

COMPUTER ENGINEERING TECHNOLOGY - Students in the program will connect their interests with advanced education in Computer Engineering. They will have the chance to explore the computer/digital field through theory and hands-on practice, with emphasis on hardware. Students will learn about: electronic/electrical fundamentals, digital hardware, microcontroller languages and systems, digital data transmission, computer networks and protocols, and computer interfacing.

ELECTRICAL ENGINEERING TECHNOLOGY – CONTROL - Students discover the principles and knowledge of electrical and electronic systems, Industrial control systems, programmable logic controllers, and speed drive systems, Electrical power generation protection and control systems, Electrical metering and distribution, Digital industrial control systems

ENERGY SYSTEMS ENGINEERING TECHNOLOGY - Students in the program will: gain an integrated skill sets for a variety of employment opportunities tied to the implantation of renewable and clean energy systems. Experience a unique new program introducing a multi disciplinary approach that focuses on the generation, capture, storage, and distribution of clean and renewable energy and their integration with conventional systems. Learn strategies for conservation and clean energy supported by micro grids and

distributed energy systems. The program will focus on clean energy including nuclear and renewable energy sources such as: wind, bioenergy, hydro power, solar/photovoltaic, solar thermal, and geothermal.

ADMINISTRATION, FACULTY & SUPPORT STAFF - ELECTROTECH

DEAN	Tony Thoma, B.Sc., BBA, MBA, P .Eng.
ASSOCIATE DEAN	Tom Low .PhD
ADMIN ASSITANT	Gini Giacomelli
TECHNOLOGISTS	John Anger George Voros

FULL TIME FACULTY	Nafia Almutawaly	Richard Ma
	Ahmed Arkoub	Mohsin Mollah
	Stephen Eagle	Majlinda Qarri
	Bernd Habicht	Larry Petkov
	Jana Jilek	Rakesh Sharma
	Sabu Joseph	Brian Stefanchuk
	Rubaid Khan	Katherine Usik
	Vijay Khatri	John Van Loon
	Daisy Korah	Jim Wilks

PART TIME FACULTY	Laith Al-Musawi	George Mychailenko
	Hassanain Awadh	Hashem Nasrollahi
	Peter Basl	Brad Pearman
	Mohy Bayat	Tom Wanyama
	Reno D'Agostino	Shane Yardimci
	Susan Derrah	Yifan Zhang
	Mohammed Elneel	
	Mihail Georgiev	

JOB CENTRE/COOPERATIVE EDUCATION	
Dean Of Interdisciplinary Studies	Jim Vanderveken
Employment Consultant	Victoria Smart

ADMINISTRATION, FACULTY & SUPPORT STAFF - CSAIT

DEAN	Tony Thoma, B.Sc., BBA, MBA, P .Eng.
ASSOCIATE DEAN	Tom Low .PhD
ADMIN ASSITANT	Gini Giacomelli

FULL TIME FACULTY	Dennis Angle	Denise Hager
	Duane Bender	John Holloway
	Kristin Bolstad	Glen Lederman
	Ron Bruch	Bob Lewis
	Ali Cheaib	James Long
	Wayne Collins	Brian Minaji
	Nick Corkigian	Sharon Scollard
	Benjamin Curtis	Rick Trottier
	Sheldon Doyle	Martin Weddum
	Christine French	Mark Yendt

PART TIME FACULTY	Paul Brown	Justin Linton
	David Cole	Jason Mascioli
	Justin Fyfe	Konstantino Mathioudakis
	Simon Galton	Al Mithani
	Krishnendu Goswami	Judi Pare'
	John Heij	Paul Perrault
	Jim Higgins	John Weber
	Mark Jordan	Peter Wong
	Simon Kerr	Benjamin Yankson

GENERIC SKILLS	Janet Munn
	Teresa Piastun

JOB CENTRE/COOPERATIVE EDUCATION

Dean Of Interdisciplinary Studies	Jim Vanderveken
Employment Consultant	Wendy Edwards

POST-SECONDARY DIPLOMA AND CERTIFICATE PROGRAMS

ECET offers both two-year programs (Technician) and three-year programs (Technology) leading to a Diploma.

The **Technician** programs offered by ECET include:

Computer Systems Technician – Software Support
Computer Systems Technician – Network Systems

The **Technology** programs offered by ECET include:

Computer Systems Technology – Software Development
Computer Systems Technology – Network Engineering and Systems Analyst
Computer Engineering Technology
Electrical Engineering Technology – Control
Energy Systems Engineering Technology

All the technology programs are co-operative in nature. Students must meet the minimum requirement of eight months work experience on co-op in order to graduate with a Co-op Diploma. Students within each discipline must compete for the available co-op jobs, and go through an interview and selection process. There is a service fee for co-operative education. The department is assisted by the Job Centre and Co-operative Education whose sole purpose is to seek out positions, assist the students in getting placed, and evaluate their performance in the field. For more information on co-op please see the Co-operative Education section in this handbook or see Cooperative Education on the college website.

AWARDS, SCHOLARSHIPS, AND BURSARIES

A variety of awards, scholarships, and bursaries are available every year through the Student Awards Office in the College. Each award has criteria written by the donor. Some awards are open to all Mohawk College students, while others are only open to specific Faculties within the College. We have included a partial list of awards from previous years that were available to students in the Electrical and Computer Engineering Technology Department. These awards are dependent upon the donors and we cannot guarantee that these awards will be offered every year.

Electrotechnology Awards, Scholarships and Bursaries

CRS Robotics Bursary
Electrotechnology Advisory Committee Scholarship
Gennum Corporation Bursary
Hamilton Electrical Maintenance Association Bursary
Heng Chan Memorial Scholarship
Hydro One Student Sponsorship Scholarship
Hydro One Bursary
IESO Independent Electricity System Operator Scholarship
Michael Kozary Memorial Scholarship
Mohawk College Electrotechnology Advisory Committee Scholarship
Rockwell Automation Scholarship
Westinghouse Bursary

Computer Science Awards, Scholarships and Bursaries

Computer Science Advisory Committee Scholarship
Datasym Inc. Bursary
Gabe & Mauro Lollo Bursary
Mark Moore Memorial Scholarship
Mohawk College Computer Science Advisory Committee Information Technology Scholarship
Mover & Shaker Scholarship
Zonta Club of Hamilton 1 Bursary

A variety of bursaries are also available to students through the Financial Aid and awards office (905)575-2133

TECHNICIAN or TECHNOLOGIST: WHAT'S THE DIFFERENCE

The difference between technicians and technologists is a difficult concept to describe. There are people who may be classified as technicians in the workplace but perform the work of a technologist, and the reverse also applies.

A technician is normally someone who is skilled in handling instruments and performs tasks that require specialized skills, training, and knowledge. Technicians will choose from several available methods to solve problems where measure variables are involved and information is readily obtainable. Technicians will use basic algebra, geometry, trigonometry, and standard software packages to mathematically analyze conditions. They will troubleshoot systems to locate and repair faulty components. Technicians will perform repetitive design tasks and sometimes make site-specific and minor changes to existing plans, layouts and calculated values.

A technologist goes beyond the repetitive application of process. Technologists deal more with abstract concepts that are not readily demonstrated, but proven by means of indirect measurement and inference. They deal with complex, integrated systems of equipment, structures and processes. Technologists will develop methods of data collection and analysis, often leading to solutions which are complex. They troubleshoot problems and develop design improvements or alternative product applications. Technologists are adaptive individuals and will be looking for new and better ways to apply current technologies to their jobs.

Does that help?

In more general terms, technologists will normally have more responsibility and decision-making in their jobs than technicians. As a consequence of his the technologist requires more training and will normally have greater career opportunities and higher salary expectations.

No matter what program a student graduates from however, success is largely dependent on the student, and goals that he/she sets for him/herself.

Computer Systems Technician – Network Systems

Co-operative Education Program (455), Non - Co-operative Education Program (447)
A Two-Year Diploma Program
Start Date: September and January
Fennell Campus

Connect your skills with a career in Network Systems. Students will gain expert knowledge of networks and connectivity and develop excellent communication, problem-solving and teamwork skills.

The Program

The program provides students with the opportunity to experience:

- Installing and configuring computer operating systems, server operating systems and services
- Desktop virtualization
- Providing user support and troubleshooting
- Excellent communication, problem-solving and teamwork skills

A "Hands-On" Education

The Network Systems Program consists of four in-school semesters. The program of studies is heavily lab and applications oriented to prepare the graduate for the working world. The Network Systems Technician is a vital and respected participant in the installation and configuration of hardware and software problems.

Career Opportunities

Industries of Employment:

- Professional, Scientific and Technical Services
- Administrative, Support Services , and Educational Services

Occupational Categories:

- End User Support
- Network Server Administration

Opportunities for Graduates

Graduates can pursue further studies with a transfer to the 3rd year of Computer Systems Technology - Network Engineering & Security Analyst program. Graduates may be eligible to register as associate members of the Ontario Association of Certified Engineering Technicians and Technologists (OACETT).

Co-operative Education

In addition to the four in-school semesters, this program includes 8 months of paid work term opportunities. Co-operative education means that graduates have real life work experience in

the computer technology field. Co-operative Education works with each student to develop program related work opportunities.

Admissions to the Program

- OSSD or equivalent (GED, College and Career Preparation) including:
  - Grade 12 English, C or U or equivalent
  - Grade 12 Mathematics, C (MCT4C recommended) or U
- A working knowledge in computers and desktop applications is required for success in this program
- Options are available for mature applicants. Please contact Admissions for more information.

Application deadlines for first year applicants may be found on the OCAS website www.ontariocolleges.ca. Applicants with applicable work experience and/or post-secondary education will be considered for advance standing on an individual basis.

The Program of Studies

The following details the existing program of studies (POS) for the Network Systems program. This POS is reviewed on an annual basis and reflects the status of the program as of the revised date shown on the inside cover of this handbook.

ACADEMIC SEMESTER 1			
Course #		**Course Title**	**Hours/Week**
COMP	10001	Programming Fundamentals	5
COMP	CO710	HTML & CSS	4
COMP	CO910	Introduction To Networking	4
MATH	10042	Math for Computer Studies	4
COMM	LL041	Communications	3
Total Hours/Week			**20**

ACADEMIC SEMESTER 2			
Course #		**Course Title**	**Hours/Week**
COMP	10024	Fundamentals of UNIX	4
COMP	10041	Microsoft Server Administration Part 1	4
COMP	10043	TCP/IP Internet Services	4
COMP	10110	Virtualization	4
MATH	10051	Discrete Math and Stats	3
OPEL	XXXXX	General Education 1 Option Table	2

Total Hours/Week	**21**

ACADEMIC SEMESTER 3			
Course #		**Course Title**	**Hours/Week**
COMP	10017	Email Server Administration	4
COMP	10018	Unix Administration 1	4
COMP	10021	Wireless Networking	4
COMP	10023	Cisco 1	4
COMP	10051	Microsoft Server Administration Part 2	4
OPEL	XXXXZ	General Education 2 Option Table	2
Total Hours/Week			**22**

ACADEMIC SEMESTER 4			
Course #		**Course Title**	**Hours/Week**
COMM	10265	Critical and Innovative Thinking	2
COMP	10019	Network Infrastructure	4
COMP	10022	ITIL Client Support	4
COMP	10111	PowerShell Admin Scripting	4
COMP	10123	Managing Mobile Devices	4
COMP	C0924	Web Server Administration	4
Total Hours/Week			**22**

Many courses in Computer Systems Technician – Network Systems have equivalent courses offered through Continuing Education. For more information about completing part of the program of studies on a part time basis through Continuing Education, please contact the ECET department for an appointment 905-575-1212.

Computer Systems Technology – Network Engineering and Security Analyst

Co-operative Education Program (555)
A Three-Year Advanced Diploma Program
Start Date: September and January
Fennell Campus

The Network Engineering and Security Analyst program at Mohawk College gives students the chance to develop the technical skills necessary to fully manage sophisticated, multi-vendor computer network environments. Graduates will have the skill sets needed to handle the day-to-day administration, security and design responsibilities for business networks of all sizes.

The Program

The program provides students with the opportunity to gain expert knowledge of networks and connectivity and develop excellent communication, problem-solving and teamwork skills. The Computer Systems Technology – NESA program gives students the opportunity to excel in:

- Network connectivity
- Virtual infrastructure

Students will also explore:

- Scripting for system administration
- Security auditing and computer forensics
- Cloud computing technologies

The Career Opportunities

Industries of Employment:

- Professional, Scientific and Technical Services
- Administrative and Support Services
- Educational Services

Occupational Categories:

- Network Administrators
- Security Analyst/Security Administrators
- IT Support Specialists
- Technical Support Analyst
- Computer Forensics

Opportunities for Graduates

Graduates may be eligible to register as associate members of the Ontario Association of Certified Engineering Technicians and Technologists (OACETT). Degree transfer opportunities available.

Co-operative Education

In addition to the six in-school semesters, this program includes 12 months of paid work term opportunities. Co-operative education means that graduates have real life work experience in the computer technology field. Co-operative Education works with each student to develop program related work opportunities.

Admissions to the Program

- OSSD or equivalent (GED, College and Career Preparation) including:
  - Grade 12 English, C or U or equivalent
  - Grade 12 Mathematics, C (MCT4C recommended) or U
- A working knowledge in computers and desktop applications is required for success in this program
- Options are available for mature applicants. Please contact Admissions for more information.

Application deadlines for first year applicants may be found on the OCAS website www.ontariocolleges.ca. Applicants with applicable work experience and/or post-secondary education will be considered for advance standing on an individual basis.

The Program of Studies

The following details the existing program of studies (POS) for the Network System and Security Analyst program. This POS is reviewed on an annual basis and reflects the status of the program as of the revised date shown on the inside cover of this handbook.

ACADEMIC SEMESTER 1			
Course #		**Course Title**	**Hours/Week**
COMP	10001	Programming Fundamentals	5
COMP	CO710	HTML & CSS	4
COMP	CO910	Introduction To Networking	4
MATH	10042	Math for Computer Studies	4
COMM	LL041	Communication	3
Total Hours/Week			**20**

ACADEMIC SEMESTER 2			
Course #		**Course Title**	**Hours/Week**
COMP	10024	Fundamentals of UNIX	4
COMP	10041	Microsoft Server Administration Part 1	4
COMP	10043	TCP/IP Internet Services	4
COMP	10110	Virtualization	4
MATH	10051	Discrete Math and Stats	3
OPEL	XXXXX	General Education 1 Option Table	2
Total Hours/Week			**21**

ACADEMIC SEMESTER 3			
Course #		**Course Title**	**Hours/Week**
COMP	10017	Email Server Administration	4
COMP	10018	Unix Administration 1	4
COMP	10021	Wireless Networking	4
COMP	10023	Cisco 1	4
COMP	10051	Microsoft Server Administration - Part 2	4
OPEL	XXXXX	General Education 2 Option Table	2
Total Hours/Week			**22**

ACADEMIC SEMESTER 4			
Course #		**Course Title**	**Hours/Week**
COMM	10265	Critical and Innovative Thinking	2
COMP	10019	Network Infrastructure	4
COMP	10022	ITIL Client Support	4
COMP	10111	PowerShell Admin Scripting	4
COMP	10123	Managing Mobile Devices	4
COMP	C0924	Web Server Administration	4
Total Hours/Week			**22**

ACADEMIC SEMESTER 5			
Course #		**Course Title**	**Hours/Week**
COMP	10025	Database Server Administration	4
COMP	10026	Network Security & Firewalls	4
COMP	10032	Unix Security	4
COMP	10033	Network Integration	4
COMP	10042	Network Design Project	4
Total Hours/Week			**20**

ACADEMIC SEMESTER 6			
Course #		**Course Title**	**Hours/Week**
COMP	10027	Protocol Analysis & Troubleshooting	4
COMP	10028	Cisco 2	4
COMP	10030	Microsoft Security	4
COMP	10031	Security Auditing Forensics	4
Option – Select 1 course from the option list below:			
COMP	10054	Introduction to Mainframes	4
COMP	10097	Virtual Infrastructure	4
COMP	10112	Perl Administrative Scripting	4
Total Hours/Week			**20**

Many courses in Computer Systems Technology – Network Engineering Security Analyst have equivalent courses offered through Continuing Education. For more information about completing part of the program of studies on a part time basis through Continuing Education, please contact the ECET department for an appointment 905-575-1212.

Computer Systems Technician – Software Support

Cooperative Education Program (548), Non-Cooperative Education Program (558)
A Two-Year Diploma Program
Start Date: September and January
Fennell Campus

Connect your skills with a career in Software Support. Students will gain experience and knowledge in a broad range of computer applications, databases and software tools.

The Program

The Software Support program provides students with the opportunity to experience:

- Project planning
- Technical Writing
- Programming languages, and Web design

A "Hands-On" Education

The Computer System Technician - Software Support program consists of four in-school semesters. The program of studies is heavily lab and applications oriented to prepare the graduate for the working world. The Software Support Technician Program is designed to prepare you into the exciting career path.

Career Opportunities

Industries of Employment:

- Professional, Scientific and Technical Services
- Administrative, Support Services , and Educational Services

Occupational Categories:

- Business Systems Support
- Web Master, Database Support
- Technical Writer, Technical Support Specialist , and User Training

Opportunities for Graduates

Graduates can pursue further studies with a transfer to the 3rd year of Computer Systems Technology – Software Development program. Graduates may be eligible to register as associate members of the Ontario Association of Certified Engineering Technicians and Technologists (OACETT)

Co-operative Education

In addition to the four in-school semesters, this program includes 8 months of paid work term opportunities. Co-operative education means that graduates have real life work experience in the computer technology field. Co-operative Education works with each student to develop program related work opportunities.

Admissions to the Program

- OSSD or equivalent (GED, College and Career Preparation) including:
  - Grade 12 English, C or U or equivalent
  - Grade 12 Mathematics, C (MCT4C recommended) or U
- A working knowledge in computers and desktop applications is required for success in this program
- Options are available for mature applicants. Please contact Admissions for more information.

Application deadlines for first year applicants may be found on the OCAS website www.ontariocolleges.ca. Applicants with applicable work experience and/or post-secondary education will be considered for advance standing on an individual basis.

The Program of Studies

The following details the existing program of studies (POS) for the Software Support program. This POS is reviewed on an annual basis and reflects the status of the program as of the revised date shown on the inside cover of this handbook.

ACADEMIC SEMESTER 1			
Course #		**Course Title**	**Hours/Week**
COMP	10001	Programming Fundamentals	5
COMP	CO710	HTML & CSS	4
COMP	CO910	Introduction To Networking	4
MATH	10042	Math for Computer Studies	4
COMM	LL041	Communication	3
Total Hours/Week			**20**

ACADEMIC SEMESTER 2			
Course #		**Course Title**	**Hours/Week**
COMP	10062	Programming in Java	5
COMP	10063	Adobe Applications – Web	4
COMP	10064	Computer Training & Technical Writing	4
COMP	C0826	Introduction System Analysis Design	4
MATH	10051	Discrete Math & Statistics	3
OPEL	XXXXX	General Education 1 Option Table	2
Total Hours/Week			**22**

ACADEMIC SEMESTER 3			
Course #		**Course Title**	**Hours/Week**
COMM	10265	Critical and Innovative Thinking	2
COMP	10039	Programming in .NET	5
COMP	10065	PHP & JavaScript	4
COMP	10123	Business Fundamentals for IT	3
COMP	C0845	Strategic Systems	4
COMP	C0859	Database Theory	4
Total Hours/Week			**22**

ACADEMIC SEMESTER 4			
Course #		**Course Title**	**Hours/Week**
COMM	10066	Software Quality & Testing	4
MGMT	10008	Project Management for IT	4
OPEL	XXXXZ	General Education 2 Option Table	2
Option – Select 3 course(s) from the option list below:			
COMP	10067	Server, Platforms & Networking Sec	4
COMP	10069	Microsoft Office Power User	4
COMP	C0835	Object Orient Systems	4
COMP	10133	HTML5 and Mobile Web Development	4
COMP	C0884	Web Application ASP.NET	4

Many courses in Software Support program have equivalent courses offered through Continuing Education. For more information about completing part of the program of studies on a part time basis through Continuing Education please contact the ECET department for and appointment 905-575-1212.

Computer Systems Technology – Software Development

Cooperative Education Program (559)
A Three-Year Advanced Diploma Program
Start Date: September and January
Fennell Campus

The Software Development program at Mohawk College gives students the chance to develop the technical skills and gain knowledgeable experience with a broad range of application development and computer systems. Students have the opportunity to complete a specialist designation in Web Applications, Enterprise Applications or Health Informatics.

The Program

The Computer Systems Technology – Software Development program gives students the opportunity to excel in:

- programming languages, database development
- web tools and database design
- system/business analysis
- e-commerce, project management and enterprise technologies

The Career Opportunities

Industries of Employment:

- Professional, Scientific and Technical Services
- Administrative and Support Services
- Educational Services

Occupational Categories:

- Database Administrator
- Application Programmer
- Systems Design and Development
- Project Management

Opportunities for Graduates

Graduates may be eligible to register as associate members of the Ontario Association of Certified Engineering Technicians and Technologists (OACETT). Degree transfer opportunities available.

Co-operative Education

In addition to the six in-school semesters, this program includes 12 months of paid work term opportunities. Co-operative education means that graduates have real life work experience in the computer technology field. Co-operative Education works with each student to develop program related work opportunities.

Admissions to the Program

- OSSD or equivalent (GED, College and Career Preparation) including:
    - Grade 12 English, C or U or equivalent
    - Grade 12 Mathematics, C (MCT4C recommended) or U
- A working knowledge in computers and desktop applications is required for success in this program
- Options are available for mature applicants. Please contact Admissions for more information.

Application deadlines for first year applicants may be found on the OCAS website www.ontariocolleges.ca. Applicants with applicable work experience and/or post-secondary education will be considered for advance standing on an individual basis.

The Program of Studies

The following details the existing program of studies (POS) for the Software Development program. This POS is reviewed on an annual basis and reflects the status of the program as of the revised date shown on the inside cover of this handbook.

ACADEMIC SEMESTER 1			
Course #		**Course Title**	**Hours/Week**
COMP	10001	Programming Fundamentals	5
COMP	CO710	HTML & CSS	4
COMP	CO910	Introduction To Networking	4
MATH	10042	Math for Computer Studies	4
COMM	LL041	Communication	3
Total Hours/Week			**20**

ACADEMIC SEMESTER 2			
Course #		**Course Title**	**Hours/Week**
COMP	10062	Programming in Java	4
COMP	10063	Adobe Applications – Web	4
COMP	10064	Computer Training & Technical Writing	4
COMP	C0826	Introduction System Analysis Design	4
MATH	10051	Discrete Math & Statistics	3
OPEL	XXXXX	General Education 1 Option Table	2
Total Hours/Week			**22**

ACADEMIC SEMESTER 3			
Course Code		**Course Title**	**Hours/Week**
COMP	10123	Business Fundamentals for IT	3
COMM	10126	Critical and Innovative Thinking	2
COMP	10039	Programming in .NET	5
COMP	10065	PHP & JavaScript	4
COMP	C0845	Strategic Systems	4
COMP	C0859	Database Theory	4
Total Hours/Week			**22**

ACADEMIC SEMESTER 4			
Course #		**Course Title**	**Hours/Week**
COMM	10066	Software Quality & Testing	4
MGMT	10008	Project Management for IT	4
OPEL	XXXXZ	General Education 2 Option Table	2
Option – Select 3 course(s) from the option list below:			
COMP	10067	Server, Platforms & Networking Sec	4
COMP	10069	Microsoft Office Power User	4
COMP	C0835	Object Orient Systems	4
COMP	10133	HTML5 and Mobile Web Development	4
COMP	C0884	Web Application ASP.NET	4
Total Hours/Week			**20**

ACADEMIC SEMESTER 5			
Course #		**Course Title**	**Hours/Week**
COMP	10076	Capstone Project Prep	1
COMP	10126	Oracle PL/SQL Programming	4
COMP	C0858	IT Management	5
Option – Select 3 course(s) from the option list below:			
COMP	10038	Mainframe Systems	4
COMP	10068	Advance Programming in .NET	4
COMP	10073	Android Application Development	4
COMP	10078	Service Oriented Architecture	4
COMP	10127	Advanced PHP	4
Total Hours/Week			**22**

ACADEMIC SEMESTER 6			
Course #		**Course Title**	**Hours/Week**
COMP	10071	Capstone Project	8
COMP	C0867	Software Engineering Project	4
Option – Select 3 course(s) from the option list below:			
COMP	10070	IPhone Programming	4
COMP	10072	Enterprise Java	4
COMP	10075	Electronic Health Record Solution	4
COMP	10125	Web 2.0 & PHP Frameworks	4
Total Hours/Week			**24**

Many courses in Software Development have equivalent courses offered through Continuing Education. For more information about completing part of the program of studies on a part time basis through Continuing Education please contact the ECET department for and appointment 905-575-1212.

Computer Engineering Technology

Cooperative Education Program (552)
A Three-Year Advanced Diploma Program
Start Date: September and January
Fennell Campus

Connect your interests with advanced education in Computer Engineering. Explore the computer/digital field through theory and hands-on practice, with emphasis on the hardware.

The Program

Students in the program will discover:

- Electronic/ electrical fundamentals
- Digital Hardware
- Microcontroller languages and systems
- Digital data transmission, computers networks and protocols, computer interfacing

The Career Opportunities

Industries of Employment:

- Professional, Scientific and Technical Services
- Federal Government Public Administration
- Educational Services
- Industrial, manufacturing and commercial facilities

Occupational Categories:

- Computer Engineering Technologists, Applications Engineering
- Teachings, Sales, Consulting
- Embedded and Microprocessor Specialists
- Network and Computer Designer
- Wireless Systems Specialist
- Application Engineering
- Product Development

Opportunities for Graduates

Graduates are eligible to register as associate members of the Ontario Association of Certified Engineering Technicians and Technologists (OACETT). Degree transfer opportunities available

Admissions to the Program

- OSSD or equivalent (GED, College and Career Preparation) including:
    - Grade 12 English, C or U or equivalent
    - Grade 12 Mathematics, U or MCT4C or MAP4C ≥ 80% or equivalent *
- Senior Physics and Chemistry are recommended
- Options are available for mature applicants. Please contact Admissions for more information.

- Students should have a working knowledge of MS Office and Office Suite prior to starting the program. Computer Skills for College COMP CO002 or equivalent is recommended. Register online at ce.mohawkcollege.ca.

Applicants that do not satisfy the minimum requirements will be provided an alternate offer to Mohawk's Pretechnology Certificate program as a pathway/foundation to a desired program. Successful graduates from this program will be considered for advanced standing into original program choice.

Applicants that would like to challenge the math requirements may do so by writing a Pre-admission assessment test for a fee.

Co-operative Education

In addition to the six in-school semesters, this program includes 16 months of paid work term opportunities. Co-operative education means that graduates have real life work experience in the computer technology field. Co-operative Education works with each student to develop program related work opportunities.

The Program of Studies

The following details the existing program of studies (POS) for the Computer Engineering Technology. This POS is reviewed on an annual basis and reflects the status of the program as of the revised date shown on the inside cover of this handbook.

ACADEMIC SEMESTER 1			
Course #		**Course Title**	**Hours/Week**
ELEC	10087	Engineering Skills 1	4
ELEC	10099	Electricity 1	5
ELEC	10118	Computer Hardware & Software	4
MATH	MA179	Engineering Mathematics 1	4
COMM	LL041	Communication	3
Total Hours/Week			**20**

ACADEMIC SEMESTER 2			
Course #		**Course Title**	**Hours/Week**
ELEC	10034	Networking Fundamentals	5
ELEC	10095	Digital Principles	5
ELEC	10100	Electronic Devices	4
ELEC	10101	Electricity 2	4
MATH	10021	Engineering Mathematics 2	3
Total Hours/Week			**21**

ACADEMIC SEMESTER 3			
Course #		**Course Title**	**Hours/Week**
COMM	10265	Critical and Innovative Thinking	2
ELEC	10103	Digital Systems	5
ELEC	10104	Electronic Circuits	4
ELEC	10112	Industrial Automation	5
MATH	10014	Engineering Mathematics 3	3
MGMT	10095	Planning and Management	2
Total Hours/Week			**21**

ACADEMIC SEMESTER 4			
Course #		**Course Title**	**Hours/Week**
ELEC	10045	Engineering Applications	4
ELEC	10049	Server Administration	5
ELEC	10050	Internet Technologies	4
ELEC	10051	Network Design & Troubleshooting	6
ELEC	10102	Advanced Server Technologies	4
Total Hours/Week			**23**

ACADEMIC SEMESTER 5			
Course #		**Course Title**	**Hours/Week**
ELEC	10060	Engineering Project 1	1
ELEC	10047	Robotics & Digital Control	4
ELEC	10052	Advanced Network Technologies	5
ELEC	10057	Embedded Systems	5
ELEC	10072	Wireless & Optical Communication	6
Total Hours/Week			**21**

ACADEMIC SEMESTER 6			
Course #		**Course Title**	**Hours/Week**
ELEC	10053	Internet Embedded Systems	5
ELEC	10054	Digital Signal Processing	4
ELEC	10056	Engineering Project 2	3
ELEC	10106	Network Security and Management	4
ELEC	10109	Electronic Design Automation	4
OPEL	XXXXX	General Education 1 Option Table	2
Total Hours/Week			**22**

Many courses in Computer Engineering Technology have equivalent courses offered through Continuing Education. For more information about completing part of the program of studies on a part time basis through Continuing Education please contact the ECET department for and appointment 905-575-1212.

Electrical Engineering Technology - Control

Cooperative Education Program (536)
A Three-Year Advance Diploma Program
Start Date: September and January
Fennell Campus

Control your future with knowledge in Electrical Engineering Technology. The Electrical Engineering Technology – Control program is part of a Hydro One Partnership and this program offers students the opportunity to explore the electrical control and power systems field through training in theory and laboratory practice.

The Program

Students in the program will:

- Principles and knowledge of electrical and electronic systems
- Industrials control systems, programmable logic controllers, and speed drive systems.
- Electrical power generation protection and control systems.
- Electrical metering and distribution
- Digital industrial control systems

The Career Opportunities

Develop, maintain or supervise the installation of industrial, power equipment, or systems for commercial, industrial, military or scientific use.

Industries of Employment:

- Industrial and Commercial organizations
- Automotive, Food and Steel Industries
- Power Generations, Transmissions and Utilities
- Process Automation
- Oil Refineries and Chemical Plants

Occupational Categories:

- Electrical Engineering Technologists
- Industrial Engineering and Manufacturing Technologists/Technicians
- Power-Transmission/Distribution Engineering Technologists/Technicians
- Power-Protection Engineering Technologists

Opportunities for Graduates

Graduates are eligible to register as associate members of the Ontario Association of Certified Engineering Technicians and Technologists (OACETT). Degree transfer opportunities available

Admissions to the Program

- OSSD or equivalent (GED, College and Career Preparation) including:
  - Grade 12 English, C or U or equivalent
  - Grade 12 Mathematics, U or MCT4C or MAP4C ≥ 80% or equivalent*****
- Senior Physics and Chemistry are recommended
- Options are available for mature applicants. Please contact Admissions for more information.
- Students should have a working knowledge of MS Office and Office Suite prior to starting the program. Computer Skills for College COMP CO002 or equivalent is recommended. Register online at ce.mohawkcollege.ca.

*Applicants that do not satisfy minimum requirements will be provided an alternate offer to Pre-Technology as a pathway/foundation to desired program. Successful graduates from this program will be considered for advanced standing into original program choice.

Applicants that would like to challenge the math requirements may do so by writing a Pre-admission assessment test for a fee.

Co-operative Education

In addition to the six in-school semesters, this program includes 16 months of paid work term opportunities. Co-operative education means that graduates have real life work experience in the electrical technology field. Co-operative Education works with each student to develop program related work opportunities.

The Program of Studies

The following details the existing program of studies (POS) for the Electrical Engineering Technology - Control. This POS is reviewed on an annual basis and reflects the status of the program as of the revised date shown on the inside cover of this handbook.

ACADEMIC SEMESTER 1			
Course #		**Course Title**	**Hours/Week**
ELEC	10087	Engineering Skills 1	4
ELEC	10099	Electricity 1	5
ELEC	10118	Computer Hardware & Software	4
MATH	MA179	Engineering Mathematics 1	4
COMM	LL041	Communication	4
Total Hours/Week			**20**

ACADEMIC SEMESTER 2			
Course #		**Course Title**	**Hours/Week**
ELEC	10034	Networking Fundamentals	5
ELEC	10095	Digital Principles	5
ELEC	10100	Electronic Devices	4
ELEC	10101	Electricity 2	4
MATH	10021	Engineering Mathematics 2	3
Total Hours/Week			**21**

ACADEMIC SEMESTER 3			
Course #		**Course Title**	**Hours/Week**
COMM	10265	Critical and Innovative Thinking	2
ELEC	10103	Digital Systems	5
ELEC	10104	Electronic Circuits	4
ELEC	10112	Industrial Automation	5
MATH	10014	Engineering Mathematics 3	3
MGMT	10095	Project Management	2
Total Hours/Week			**21**

ACADEMIC SEMESTER 4			
Course #		**Course Title**	**Hours/Week**
ELEC	10045	Engineering Applications	4
ELEC	10059	Linear Systems	3
ELEC	10066	Instrumentation & Process Control	4
ELEC	10088	Elec Eng Drafting & Design	3
ELEC	10110	Electrical Machines	4
ELEC	10111	Introductions to Power Systems	3
Total Hours/Week			**21**

ACADEMIC SEMESTER 5			
Course #		**Course Title**	**Hours/Week**
ELEC	10060	Engineering Eng Project 1	1
ELEC	10061	Control Systems	6
ELEC	10062	Advanced Power Systems	6
Option - Select 2 course(s) from option list below:			
CADM	10027	Electrical Eng Drawing & Design	3
ELEC	10047	Robotics & Digital Control	3
ELEC	10063	Industrial Electronics & PLC	6
ELEC	10072	Wireless & Optical Communication	6
Total Hours/Week			**19**

ACADEMIC SEMESTER 6			
Course #		**Course Title**	**Hours/Week**
ELEC	10064	Electrical Eng Project 2	3
ELEC	10067	Power Protection & Mgmt	4
OPEL	XXXXX	General Education 1 Option Table	2
Option - Select 2 course(s) from option list below:			
CADM	10055	Automation & Industrial Networks	4
ELEC	10065	Variable Speed Drives	6
ELEC	10083	Electrical Power Generation	5
ELEC	10084	Smart Metering & Distribution	4
Total Hours/Week			**19**

Many courses in Electrical Engineering Technology program have equivalent courses offered through Continuing Education. For more information about completing part of the program of studies on a part time basis through Continuing Education please contact the ECET department for and appointment 905-575-1212.

Energy Systems Engineering Technology

Optional Cooperative Education Program (360)
A Three-Year Advanced Diploma Program
Start Date: September and January
Fennell Campus and STARRT Institute (Stoney Creek)

The Energy Systems Engineering Technology – Clean and Renewable Energy is a unique new program introducing a multi disciplinary approach that focuses on the generation, capture, storage, and distribution of clean and renewable energy and their integration with conventional systems.

The Program

Students in the program will:

- gain an integrated skill sets for a variety of employment opportunities tied to the implantation of renewable and clean energy systems
- experience a unique new program introducing a multi disciplinary approach that focuses on the generation, capture, storage, and distribution of clean and renewable energy and their integration with conventional systems
- learn strategies for conservation and clean energy supported by micro grids and distributed energy systems

The program will focus on clean energy including nuclear and renewable energy sources such as:

- wind
- bioenergy
- hydro power
- solar/photovoltaic
- solar thermal
- geothermal

The Career Opportunities

Graduates will find employment within the electricity sector, HVAC industry, building and construction sector, in various technical support roles related to the manufacture, installation, testing and repair of clean and renewable energy systems, and individual components.

Opportunities for Graduates

Complete a degree in two years! Graduates of this program are eligible to apply for the McMaster-Mohawk collaborative Bachelor of Technology Energy Engineering Technologies degree program.

Admissions to the Program

- OSSD or equivalent (GED, College and Career Preparation) including:
    - Grade 12 English, C or U or equivalent
    - Grade 12 Mathematics, U or MCT4C or MAP4C ≥ 80% or equivalent*****
- Senior Physics and Chemistry are recommended

- Options are available for mature applicants. Please contact Admissions for more information.
  Students should have a working knowledge of MS Office and Office Suite prior to starting the program. Computer Skills for College COMP CO002 or equivalent is recommended. Register online at ce.mohawkcollege.ca.

*Applicants that do not satisfy minimum requirements will be provided an alternate offer to Pre-Technology as a pathway/foundation to desired program. Successful graduates from this program will be considered for advanced standing into original program choice.

Applicants that would like to challenge the math requirements may do so by writing a Pre-admission assessment test for a fee.

Co-operative Education

In addition to the six in-school semesters, this program includes 12 months of paid work term opportunities. Co-operative education means that graduates have real life work experience in the energy systems field. Co-operative Education works with each student to develop program related work opportunities.

The Program of Studies

The following details the existing program of studies (POS) for the Energy Systems Engineering Technology – Clean and Renewable Energy program. This POS is reviewed on an annual basis and reflects the status of the program as of the revised date shown on the inside cover of this handbook.

ACADEMIC SEMESTER 1			
Course #		**Course Title**	**Hours/Week**
ELEC	10087	Engineering Skills 1	4
ELEC	10099	Electricity 1	5
ELEC	10118	Computer Hardware & Software	4
ENRG	10000	Intro Clean & Renewable Technology	2
MATH	MA179	Engineering Mathematics 1	4
COMM	LL041	Communication	4
Total Hours/Week			**22**

ACADEMIC SEMESTER 2			
Course #		**Course Title**	**Hours/Week**
ELEC	10034	Networking Fundamentals	5
ELEC	10095	Digital Principles	5
ELEC	10100	Electronic Devices	4
ELEC	10101	Electricity 2	4
MATH	10021	Engineering Mathematics 2	3
Total Hours/Week			**21**

ACADEMIC SEMESTER 3			
Course #		**Course Title**	**Hours/Week**
ELEC	10103	Digital Systems	5
ELEC	10104	Electronic Circuits	4
ELEC	10112	Industrial Automation	5
ENRG	10001	Clean & Renewable Technology 1	4
MATH	10014	Engineering Mathematics 3	3
Total Hours/Week			**21**

ACADEMIC SEMESTER 4			
Course #		**Course Title**	**Hours/Week**
ELEC	10066	Instrum & Process Control	4
ELEC	10088	Electrical Eng Drafting & Design 1	3
ELEC	10110	Electrical Machines	4
ELEC	10111	Introduction to Power Systems	3
ENRG	10002	Clean & Renewable Technology 2	5
LAWS	10081	Smart Regulations	2
Total Hours/Week			**21**

ACADEMIC SEMESTER 5			
Course #		**Course Title**	**Hours/Week**
COMM	10265	Critical and Innovative Thinking	2
ELEC	10113	Elec Eng Drafting & Design 2	3
ENRG	10003	Capstone Project 1	1
ENRG	10004	Energy Management	3
ENRG	10005	Clean & Renewable Technology 3	5
ENRG	10006	Green Building Design & LEED	3
ENRG	10007	Energy Entrepreneurship	2
Total Hours/Week			**19**

ACADEMIC SEMESTER 6			
Course #		**Course Title**	**Hours/Week**
ELEC	10084	Smart Metering & Distribution	4
ENRG	10008	Capstone Project 2	3
ENRG	10009	Energy Conversion & Integration	5
ENRG	10010	Clean & Renewable Technology 4	6
OPEL	XXXXX	General Education 1 Option Table	2
Total Hours/Week			**20**

Many courses in Energy Systems Engineering Technology have equivalent courses offered through Continuing Education. For more information about completing part of the program of studies on a part time basis through Continuing Education please contact the ECET department for and appointment 905-575-1212.

ADMISSION REQUIREMENTS AND PROCEDURES

Applications for programs beginning in September must be submitted to the Ontario College Application System (OCAS) www.ontariocolleges.ca beginning on November 1st. All applications received on or before February 1st are considered equally. After February 1st, applications are processed on a first-come, first-serve basis. Mature applicants are direct entry applicants are considered on an individual basis.

Applicants to the majority of our diploma programs require an Ontario Secondary School Diploma or equivalent, plus the following specific requirements:

- Grade 12 English
- Grade 12 U or C Mathematics

Grade 11 Math is strongly recommended for Technology applicants. Any Grade 12 U or MCT4C Math is also recommended. Grade 11 physics and chemistry are advised for some programs. Applicants who do not meet the mathematics requirements may take Preparatory Math for Technology through Continuing Education.

If the number of applicants for any program exceeds the enrolment quota, the College and ECET will select applicants using secondary school Mathematics and English grades as the primary criteria for admission. Following screening for academic requirements, selected applicants will be offered admission as early as February 1.

For all of its programs, applicants with appropriate post-secondary studies and/or work experience will be considered for advanced standing on an individual basis. The College maintains a Prior Learning Assessment and Recognition Office (905) 575 - 2395 that assists students who want credit for experiential learning. Mature applicants will take admission tests and preparatory courses, where applicable. For more information to our full-time diploma programs, contact the Admissions Office at (905) 575 - 2000

STUDENT EVALUATION AND GRADING

Mohawk College uses a credit value system that supports the calculation of a weighted grade point average. Courses are assigned a number of credits based on their total course hours and these credits are multiplied by the grade obtained in the course when calculating a grade point average. In order to receive their diploma students must complete the entire program of studies and achieve a weighted GPA of **at least 60%.**

The grading system establishes one common passing grade level of 50% for all courses. Other grades designations which the student might encounter include the following:

AC	Attendance Complete
AN	Attendance Not Met
AU	Course Audit
CR	Credit Granted (Prior Learning Assessment)
E	Exemption Complete
I	Incomplete
R	Requirements Complete
UW	Unofficial Withdrawal

It is the responsibility of the student to be aware of various policies and procedures governing the School of Engineering Technology.

HONOURS SYSTEM

There are two separate honours designations used by the College. A **Dean's Honours** list is published at the end of each semester and contains the names of full-time students who achieve an overall standing of at least 85.0% with no failing grades at the end of each academic semester. A congratulatory letter is sent to the student from the Dean and Associate Dean in each semester in which the student qualifies.

At the completion of a program of study, students who have an overall standing of at least 85% with no failing grades will qualify for **Honours Graduate** status. Honours Graduates are announced at Convocation and they will receive a congratulatory letter from the College along with an attachment for the diploma.

For further information on the Honours System and Student Evaluation and Grading please contact the Registration Centre at (905) 575-2364.

JOB CENTER

The Job Centre provides assistance to students, employers and college personnel on a year round basis. The Office acts as an employment resource link between education and industry. Employment officers provide job referral services, pertinent labour market information, career advisement, and job search presentations. For information about ECET graduate placements please call (905) 575-2167

CO-OPERATIVE EDUCATION

Co-operative Education (Co-op) extends the academic learning process into the workplace through on-the-job learning experiences. Co-op integrates the learning objectives contained in the program of studies with real life applications in the work force. These learning experiences enhance the student's vocational maturation and personal development.

The Co-operative Education Department is responsible for:

- Providing opportunities for paid, supervised off-campus work semesters in co-operating business, industry, and government agencies
- Providing comprehensive career development services for co-op students within the academic curriculum
- Enhancing the potential for graduate employment through industry contacts and career development in jobs that match the student's aspirations and training

The co-op staff's works closely with ECET to ensure the job selection process produces jobs closely related to the academic program content. This close communication also provides feedback to the Program Co-ordinators and Advisory Committees, that the most appropriate skill sets are being developed to enable student success in Canadian business and industry.

The benefits to the students who participate in co-op are numerous:

- Experiencing practical applications of academic knowledge
- Acquiring career information for future decision-making
- Developing human relations and communication skills
- Earning money and managing finances
- Developing contacts for graduate employment
- Enhancing job search and interview skills
- Developing workplace learning objectives and career goals

Co-op employers have called the work semester a "four month interview" during which they can evaluate potential employees. The benefits to the co-op employer include:

- Better opportunity to evaluate potential employees
- Provision for motivated, well-educated, and capable employees
- Increased visibility in attracting qualified personnel
- Opportunity to become a "corporate citizen" by contributing to the education process
- Reduction of recruiting costs and improved retention by ensuring a better match of individual and position

In order to gain the most benefit from co-op an employer should develop a co-op plan with definite policies, procedures and goals. Points to be considered in this plan should include:

- Accurate, informative job descriptions to stimulate student interest
- An orientation to familiarize the incoming student with the employer's situation and expectations
- Supervision of students by individuals who understand and are interested in co-op
- Increasing responsibilities in successive work semesters and returning students
- An exit interview to discuss the student's performance and future plans

SPECIAL NOTES

Students who enter a Co-op Program are expected to assume several responsibilities. They must compete for and obtain one of the available jobs or find acceptable alternative employment for the work semester. They are required to fulfil their agreements with employers and abide by the rules governing Co-operative Education. Failure to do so could result in suspension from the program and a failing grade in a work term. The format for co-op in the various programs is shown in Figure 2. Note that not all programs have the same co-op/academic semester sequence.

A student who declines to accept two job offers without just cause after interviews provided by the co-op staff may be prevented from taking further interviews. The student will then be required to find his/her own job.

Priority for co-op employment will be given to full-time students who are Canadian citizens or landed immigrants. If there are excess co-op positions available, International students may have access to the co-operative jobs.

Students participating in co-operative education will be assessed a co-op service fee per academic semester beginning with semester one.

Full guidelines for co-operative education may be obtained from the Job Centre.

The Job Centre staff attempts to provide work opportunities related to the students' career interests and program of studies. **This is not a guarantee.** The final work placement success is largely the responsibility of the student.

SEMESTER and COOP WORK TERM ROTATIONS FOR PROGRAMS

Computer Systems Technician – Software Support (2 four-month co-ops)
Computer Systems Technician – Network Systems (2 four-month co-ops)

Fall Intake

Sept – Dec	Jan – Apr	May – Aug
Semester 1	Semester 2	Vacation
Semester 3	**Work Term 1**	**Work Term 2**
Semester 4		

Winter Intake

Jan – Apr	May – Aug	Sept – Dec
Semester 1	Semester 2	Semester 3
Work Term 1	**Work Term 2**	Semester 4

Computer Systems Technology – Software Development (3 four-month co-ops)
Computer Systems Technology – Network Engineering & Security Analyst (3 four-month co-ops)

Fall Intake

Sept – Dec	Jan – Apr	May – Aug
Semester 1	Semester 2	**Vacation**
Semester 3	Semester 4	**Work Term 1**
Work Term 2	Semester 5	**Work Term 3**
Semester 6		

Fall Intake Alternate

Sept – Dec	Jan – Apr	May – Aug
Semester 1	Semester 2	**Vacation**
Semester 3	**Work Term 1**	**Work Term 2**
Semester 4	Semester 5	**Work Term 3**
Semester 6		

Winter Intake

Jan – Apr	May – Aug	Sept – Dec
Semester 1	Semester 2	Semester 3
Semester 4	**Work Term 1**	**Work Term 2**
Semester 5	**Work Term 3**	Semester 6

Winter Intake Alternate

Jan – Apr	May – Aug	Sept – Dec
Semester 1	Semester 2	Semester 3
Work Term 1	**Work Term 2**	Semester 4
Semester 5	**Work Term 3**	Semester 6

Computer Engineering Technology (4 four-month co-ops)
Electrical Engineering Technology – Control (4 four-month co-ops)
Energy Systems Engineering Technology (4 four- month co-ops)

Fall / Winter Intake

Sept – Dec	Jan – Apr	May – Aug
Semester 1	Semester 1 or 2	**Vacation**
Semester 3	Semester 4	**Work Term 1**
Semester 5	**Work Term 2**	**Work Term 3**
Work Term 4	Semester 6	

Success in securing work placement for your co-op work terms is normally reliant on academic performance, covering letters and resumes, and job interview performance.

ECET STUDENT RULES OF CONDUCT FOR TESTS AND EXAMS

In this document the term test is intended to include both “tests” and “examinations”. The term “invigilator” is meant to include any person authorized to supervise or conduct tests that is, proctors, professors, support staff, etc.

1. Students must be aware of the College’s Requirements on Academic Honesty.

2. It is the responsibility of the student to be aware of the place, starting time, and duration of all tests as well as the rules conduct which govern them.

3. Only eligible students and authorized invigilators are allowed access to the testing facility.

4. Students must bring their student identification cards and place them in a conspicuous place on their test station or desk. Students without a valid student identification card may not be permitted to write the test. Students may be required to sign an attendance record during a test.

5. Invigilators are authorized to assign specific seats to students.

6. Students are expected to arrive at the testing facility at least five (5) minutes before the scheduled commencement of the test. Students will not normally enter the testing facility until permitted to do so by the invigilator.

7. No materials and equipment, including calculators, may be taken into the testing facility except those authorized by the invigilator and/or specified by the test paper. It is the responsibility of the student to be aware of the type and nature of resources which are allowed inside the testing facility. Invigilators are authorized to inspect all equipment and materials used inside a testing facility and, if deemed appropriate, reset calculators.

8. Students who bring unauthorized resources into a testing facility, or who assist other students, or who obtain assistance from other students or any other unauthorized source, may not be permitted to complete the test. They may also be subject to further disciplinary action under the College’s Academic Honesty Requirements.

Students must not communicate in any way with one another during tests

9. Students will not be permitted access to a testing facility if a) the test has been in progress for more than thirty (30) minutes, or b) if one or more students have already left the testing facility. (Under special circumstances, the invigilator may waive this condition).
Students are not permitted to leave the testing facility during the first (30) minutes of a test.
In the event of students being late for a test, they must complete their test in the remaining designated time, unless the invigilator authorizes an extension.

10. In cases of emergency, students leaving and returning to a testing facility must be accompanied by an invigilator unless this requirement is waived by the invigilator.

11. Student must enter and leave a testing facility **QUIETLY**.
12. It is the student's responsibility to ensure that he/she has received the correct test paper and that the document contains the correct number pages and questions.

13. At the conclusion of a test, all testing activity must cease. In the event that this requirement is not observed, invigilator may refuse to accept a student's test results.
    A student must ensure that all test materials to be graded are, in fact, submitted at the conclusion of the test and contain the student's name. An examiner has no obligation to grade materials submitted by a student after that student has left the testing facility.
    Tests and testing materials specifically provided by the invigilator must not be removed from the testing facility unless the appropriate authorization is given by the invigilator.

14. Alternative testing provides students who are disabled with the opportunity to meet regular academic requirements while preserving the integrity of testing process. The office of Special Needs is governed by regular college policies and the Alternative Testing service will operate in accordance with ECET Student Rules of Conduct for Tests and exams and the Colleges Academic Honesty Requirements. Students with disabilities are required to identify themselves to the Office of Special Needs where the Special Needs Consultant will recommend alternative testing where appropriate.

    Please refer to the alternative Test/Examination procedure for students with disabilities available through the office of Special Needs.

COURSE DESCRIPTION

COMM LL041 COMMUNICATIONS (LANGS)
Enhance critical thinking and workplace communication skills in a collaborative environment.

COMM 10265 CRITICAL AND INNOVATIVE THINKING
This course will explore the growing influence of innovation and critical thinking on a global basis in the 21st century. Students will develop an advanced understanding of their individual role in the workplace through critical thinking and innovative ideas. Students will collaborate in the exploration of roles, responsibilities and issues relevant to the workplace through critical thinking and social innovation and develop advanced communication skills applied to employment-related contexts and successfully complete an e-portfolio for their future employment.

COMP 10001 PROGRAMMING FUNDAMENTALS
This course lays the foundation for learning and practicing the discipline of Software Engineering and the application of tools and methods to produce and maintain quality software systems. The course concentrates on essential software structures and logic. The programming language used in this course provides the knowledge and disciplines, which are transferable to any computer-based software problem.

COMP 10017 EMAIL SERVER ADMINISTRATIONS
Ensure a solid foundation in E-mail Administration. Configure both server and workstation software. Provide secure services for a variety of user applications to communicate with. Encrypt e-mail messages between senders and receivers. Perform data backups and recovery from loss of data. Troubleshoot connectivity and security issues.

COMP 10018 UNIX ADMINISTRATIONS 1
Establish a solid foundation in Unix Administration. Configure networking interfaces, as well as user and group administration. Address fundamental security issues. Enabling various network services and manage the myriad collection of configuration files that make up the core of a UNIX like system.
Prerequisite: COMP 10024

COMP 10019 NETWORK INFRASTRUCTURE
This course provides students with the base knowledge needed to make informed design decisions regarding the infrastructure of an enterprise level network. Detailed coverage of the function and features of widely used network hardware components will enable students to choose which are the most appropriate vendor products for a given network scenario. Network design concepts in this course focus primarily on the Physical and Data Link OSI layers for cable-based LANs. Design principles covered in this course are most often discussed in the context of Ethernet networks that adhere to the TIA/EIA-568 structured cabling standard.

COMP 10021 WIRELESS NETWORKING

This course covers the major concepts related to wireless local area networks (WLANs). Students will be able to: Describe the behavioural fundamentals and properties of radio frequency (RF) waves; Explain the major spread spectrum technologies commonly used in wireless networking environments; Design, administer, customize and troubleshoot popular IEEE 802.11 wireless network topologies.

COMP 10022 ITIL CLIENT SUPPORT

This course will develop customer service skills and techniques to prepare the students for a career as a technical support specialist. Topics will include defining, managing and maintaining service levels. Process management and implementation skills will be emphasized and demonstrated through both case study and on-line customer support tools.

COMP 10023 CISCO 1

Configure and troubleshoot Cisco routers and switches through application of networking basics. Prepare for the challenges faced in the business networking environment by practicing and testing team work skills.

Prerequisite: COMP 10043 or COMP-CO912

COMP 10024 FUNDAMENTALS OF UNIX

Establish a solid foundation with a UNIX operating system. Construct and execute well formed UNIX commands. Install end-user applications. Customize the user environment. Work with UNIX directories and files. Create and troubleshoot shell scripts.

COMP 10025 DATABASE SERVER ADMINISTRATIONS

Establish a solid foundation in Database Administration. Configure both server and workstation software. Design databases, as well as tables. Address security issues related to databases and data access. Perform data backups and recovery from a loss of data. Troubleshoot connectivity, security, and performance issues.

COMP 10026 NETWORK SECURITY & FIREWALLS

Implement network security and firewalls. Gain hands-on experience using IP Tables, Microsoft ISA and Intrusion detection systems.

Prerequisite: (COMP-10043 or COMP-CO912) and COMP-10018

COMP 10027 PROTOCOL ANALYSIS & TROUBLESHOOTNG

Establish a solid foundation in TCP/IP network performance and troubleshooting using a protocol analyzer. Implement a VOIP telephone system using Asterisk.

Prerequisite: COMP 10043 or COMP CO912

COMP 10028 CISCO 2

Configure and administer a Cisco 2621XM router through use of CLI (command line interface) and SDM (security device manager graphical interface). Configure and administer various models of the Cisco PIX/ASA Security Appliance through the use of CLI (command line interface) and ASDM/PDM graphical interfaces. Apply skills to create a functional company

infrastructure using private, public and DMZ networks controlled by VPNs and firewall application

Prerequisite: COMP 10023

COMP 10030 MICROSOFT SECURITY

Examine exploits and their solutions. The emphasis of exploits and security tools will be primarily for Windows Servers and Clients. Present different styles of exploits, solutions and enhanced security techniques.

Prerequisite: COMP-10051 or COMP CO925

COMP 10031 SECURITY AUDITING & FORENSICS

Develop hands-on skills in the areas of computer and forensic investigation. Students will learn how to perform ongoing monitoring/auditing of such systems. Carry out a forensic investigation into suspicious events, incidents or system compromises. Use third party utilities as well as the relevant Windows and UNIX system utilities and commands to perform security auditing and forensic tasks.

Prerequisite: (COMP-10041 or COMP-CO938) and COMP-10018

COMP 10032 UNIX SECURITY

Establish a solid foundation in UNIX security. Topics include: installation, patching, network security, security scanning, intrusion detection, and limited access environments.

COMP 10033 NETWORK INTEGRATION

Practice configuration and administration of typical corporate computing environments. Design and develop a variety of network environments ranging from small single server, single operating system LANs to complex multiple server, multiple operating system WANs found in corporate intranets and Internet-based networking environments.Focus on Windows and Linux servers and workstations and the implementation of common network services interacting between the two operating systems platforms.

COMP 10038 MAINFRAME SYSTEMS

This course provides students with the skills necessary to use the facilities of a mainframe computer. It covers mainframe concepts, usage and architecture, a comprehensive overview of z/OS operating system, an understanding of mainframe workloads and an overview of the major middleware applications in use in today's mainframe world. Hands-on exercises are provided throughout the course to help students explore the mainframe style of computing. Students will be expected to research the IBM Redbook library in order to complete the exercises.

COMP 10039 PROGRAMMING IN .NET

This project-based course, which follows on concepts introduced in previous programming courses, will focus on the design, development and implementation of interactive, "user friendly" software. The principal design concern will centre on GUI (Graphical User Interface); data base processing and file processing in an object-oriented programming environment. Furthermore,

students will concentrate on event-driven programming logic; in particular as it applies to navigation amongst and within forms, user data entry validation and data base and file processing. Students will develop a completely operational application, which will demonstrate ease of use and consistent interface designs. The language used will be Visual Basic NET in conjunction with Microsoft data base technology.
Prerequisite: COMP 10062

COMP 10041 MICROSOFT SERVER ADMIN-PARTS 1
Manage user and computer accounts in an Active Directory environment, manually and via group policies. Design file system access controls. Perform various administrative tasks.

COMP 10042 NETWORK DEIGN PROJECT
Create logical and physical network designs to meet given technical standards and priorities then provide rationale supporting these design decisions. Use vendor websites to document the hardware cost of the physical network design.
Prerequisite: COMP 10019

COMP 10043 TCP/IP INTERNET SERVICES
Establish a solid foundation of theory and hands on skills required to administer a TCP/IP network.

COMP 10051 MICROSOFT SERVER ADMIN-PARTS 2
This course focuses on commonly performed and/or repetitive enterprise level Windows administrative tasks. In the first half of the course students will work with built-in Windows utilities to perform administrative tasks. In the second half of the course students will use Windows PowerShell to create customized scripts capable of performing administrative tasks.
Prerequisite: COMP-10041 or COMP-CO938

COMP 10054 INTRODUCTIONS TO MAINFRAMES
This course will provide students an introduction to mainframe concepts, usage, workloads and architecture as well as a comprehensive overview of the z/OS mainframe operating system. Students will also be given an overview of the major middleware applications being deployed on mainframes.

COMP 10062 PROGRAMMING IN JAVA
This second semester course builds upon the logic and object oriented programming concepts developed by the Programming Fundamentals course (COMP10001). The course concentrates on the creation and use of classes as an object type, but still covers the basic elements that many traditional languages use, i.e., control structures, arrays, and file I/O. Though the principle programming language used in this course is Java, the knowledge and basics of this course are transferable to any similar OOP computer language.
Prerequisite: COMP 10001

COMP 10063 ADOBE APPLICATIONS - WEB

This course will concentrate on developing and manipulating various forms of digital media such as text, graphics, sound and video. On successful completion of this course the student will be able to use multimedia software tools to work with text, create graphics, manipulate photos, slice images, create engaging animations, and design rich web content pages. Also, through this course the student will be able to understand the various considerations of multimedia on the web and other application areas; critique the quality of graphical interfaces in regard to aesthetics, ease of use, efficiency; and apply the appropriate multimedia technology dependent on the audience and the application.

Prerequisite: COMP CO710

COMP 10064 COMPUTER TRAINING & TECH WRITING

In this course students will build the skills necessary for training software users, and will create support documents to facilitate this. Topics include learning modalities, special needs students, methods of evaluation and training delivery, evaluating training solutions and creating training materials. Practice training sessions and presentation skills will also be emphasized.

COMP 10065 PHP & JAVASCRIPT

An introduction to two of the major scripting languages used in the creation of dynamic web pages: PHP and JavaScript.

Prerequisite: COMP 10062 and COMP 10063

COMP 10066 SOFTWARE QUALITIES & TESTING

This course will focus on steps and procedures to ensure the production of high quality software. The course will be delivered using a hands-on approach to allow students to build and design test procedures, quality feedback mechanism, test planning and test documentation.

Prerequisite: COMP 10001

COMP 10067 SERVERS, PLATFORMS & NETWORKING SECURITY

Students will diagram, install and configure major components, middleware, operating; systems and security mechanisms commonly employed in web based applications.

COMP 10068 ADVANCED PROGRAMMING IN .NET

This is an intermediate level-programming course in object-oriented programming using C#. Topics include: classes, data encapsulation, inheritance, polymorphism and operator overloading.

Prerequisite: COMP 10039

COMP 10069 MICROSOFT OFFICE POWER USER

Students will focus on some of the advanced capabilities of the Microsoft Office suite. Topics will include integration and interoperability, using external data and automation through macro/script programming.

COMP 10070 IPHONE PROGRAMMING

This course is a hands-on introduction to the major topics in developing applications native to the iPhone, iPod Touch and iPad platforms. Topics include using the Xcode development environment, Objective-C, the Cocoa framework and Interface Builder to create mobile and multitouch applications.

COMP 10071 CAPSTONE PROJECT

Development of significant software system, employing knowledge gained from courses throughout the program. Includes development of requirements, design, implementation, and quality assurance. Students may follow any suitable process model, must pay attention to quality issues, and must manage the project themselves, following all appropriate project management techniques. Success of the project is determined in large part by whether students have adequately solved their customer's problem.

COMP 10072 ENTERPRISE JAVA

This course will expose students to the Java programming language as it is used in Enterprise computing. Students will encounter Java Server Pages and Enterprise JavaBeans.

COMP 10073 MOBILE PROGRAMMING

This course is a hands-on introduction to the major topics in developing applications for mobile platforms.

COMP 10075 ELECTRONIC HEALTH RECORD SOLUTION

Students will learn about the Electronic Record Solution as proposed by Canada Health Infoway. The course will explore the architecture of the EHRS as well as the operational landscape of the Healthcare system in Canada.

COMP 10076 CAPSTONE PROJECT PREP

Students will choose a subject for their Capstone Project. A project plan will be prepared. Faculty will review material to ensure that project scope is appropriate. Students will not be permitted to begin their Capstone Project until approval is received from faculty.

COMP 10078 SERVICE ORIENTED ARCHITECTURE

This course will expose students to SOA. There will be an in depth examination of the protocols that support SOA, XML, SOAP and Web Services.

COMP 10097 VIRTUAL INFRASTRUCTURE

This course will cover the installation and configuration of a Virtualized Computer Infrastructure. Dynamic mapping of processors, storage and network resources will also be covered

COMP 10110 VIRTUALIZATION

This course covers the major concepts related to desktop virtualization. Students will be able to install and configure multiple virtualization packages; install and execute various Operating Systems from within virtual machines; understand the terminology and features of multiple virtualization packages and install and configure virtual hardware and networking components.

COMP 10111 POWERSHELL ADMIN SCRPTING

This course develops the hands-on skills needed to create custom PowerShell scripts that are capable of performing complex, repetitive and/or time consuming Windows administration tasks for both local and domain environments.

Prerequisite: COMP 10051

COMP 10112 PERL ADMIN SCRIPTING

Creation of script programs to perform complex, repetitive, and time consuming administrative tasks. Programming scripts which are designed include those for automated and unattended routines, log file parsing, database interfacing, security analysis, and real-time computer system monitoring using Perl.

COMP 10123 MANAGING MOBILE DEVICES

Develop the knowledge required to manage mobile devices in a corporate network environment.

COMP 10125 WEB 2.0 & PHP FRAMEWORKS

Web 2.0 and PHP Frameworks teaches students how to develop and deploy database driven web applications using popular MVC OOP frameworks such as CodeIgniter or Zend. The use of JQuery/JavaScript is employed to enhance front-end design. This course will cover all aspects of using a framework including the following topics: controllers, models, views, libraries, helpers, from validation, database interaction, user authentication, application security. Each student will complete a dynamic database driven web site as part of this project oriented course.

COMP 10126 ORACLE PL/SQL PROGRAMMING

Students will explore advanced topics in SQL, including functions, subqueries and complex joins. Students will also learn how to assemble PL/SQL statements into useful blocks of code. General programming structures, conditional control, iterative control and error handling will also be studied. Additional topics will include cursor, triggers, procedures, functions and packages.

COMP 10127 ADVANCED PHP

Advanced PHP teaches students how to develop and deploy database driven web applications using PHP and MySQL. Special attention is paid throughout the course to use a Model-View-Controller style of programming. This course uses object oriented and functional programming methodology. Additional topics include the use of JQuery/JavaScript to enhance front-end design, CSS Templates, AJAX, SQLite, PDO, PDF generation, email, Sessions, Cookies and the design of multi-page web sites with a user authentication class.

COMP 10132 BUSINESS FUNDAMENTALS FOR I.T.

Selected topics in business administration will be presented with emphasis on their application to IT, and IT's impact on them. Emphasis will be placed on using the classic

tools of business administration to make informed management decisions. Case studies and scenario-based exercises will be used extensively.

COMP 10133 HTML5 AND MOBILE WEB DEVELOPMENT

This course provides an overview of the evolving HTML5 and CSS3 standards with an emphasis on designing portable web sites that are efficient and compatible across platforms. Students require an understanding of the Document Object Model (DOM), JavaScript and jQuery and must be familiar with server side technologies such as .NET or PHP. Topics in this course includes building forms, CSS3 selectors, video/audio, canvas tag, drag and drop, data storage, geolocation and authoring HTML content for mobile web sites.

COMP C0710 WEB LANGUAGES & TOOLS 1

Provides an overview of the Hypertext Mark-up Language (HTML) used to create Web site pages. Topics include basic design, formatting, hypertext links, tables, forms and the use of cascading style sheets.

COMP C0826 INTRO-SYSTEM ANALYSIS & DESIGN

Upon successful completion of this course, the student will have demonstrated: An understanding of the steps involved in approaches and investigating system requirements. Knowledge of the principles in modeling and evaluating alternatives and strategies. An understanding of developing project schedules, requirements analysis and cost/benefit analysis. Knowledge of output design and the ability to design outputs. Knowledge of input design and the ability to design inputs. An understanding of the Human-Computer Interaction. Knowledge of the processes involved in systems operation and support.

COMP C0835 OBJECT ORIENTED SYSTEMS

The course introduces the student to Object-Oriented methodology including topics in complexity, modularity, object based systems thinking and Unified Modeling Language (UML).

COMP C0845 STRATEGIC SYSTEMS

Strategic Information Systems are conventional information systems used in innovative and competitive ways. As information systems evolved from transaction processing systems to management information systems, to decision support systems, they started to have impact on how the business firm competes.

Prerequisite: COMP CO826 or COMP CO835

COMP CO858 IT MANAGEMENT

Managing the information technology function in the modern business organization demands a good grasp of management concepts and a detailed knowledge of the specific technical and resource issues surrounding the I.T. function. This course will overview general management concepts and examine current I.T. management issues using resource materials which are updated annually. Systems, models, and measurements that should assist the I.T. manager in improving quality and increasing value are examined closely. Within a framework laid out by the professor, students will research and report on major issues and will develop software based models for some of the metrics studied. Students will solve a number of situational management

problems that will require the integration of previous academic and work experience to arrive at practical solutions. The expected outcome is a student well equipped to examine, comprehend, and critically assess the complex decision situations confronting I.T. managers.

COMP C0859 DATABASE THEORY

The student who successfully completes this course will demonstrate knowledge of database terms, SQL, Normalization, Entity Relationship Diagramming, Physical Structures and Database Administration.

COMP CO867 SOFTWARE ENGINEERING PROJECT

Upon the successful completion of this course, the student will appreciate and be able to participate in future activities related to the following areas (in no order of importance): Research and Innovation Resource Planning and Management Entrepreneurial ship Group Dynamics and Conflict Resolution Marketing Consulting Documentation Testing Risk Management Project Book Keeping Strategic Information Systems Reporting to Upper Management Cost and Budget Estimation Resource Budgeting.

COMP C0884 WEB APPLICATION ASP .NET

Build dynamic web applications and services, especially with regard to developing those that will help businesses access, update, and process databases. Use web application frameworks, object-oriented programming language, as well as database computer languages.

COMP C0910 INTRODUCTION TO NETWORKING

In this course students are introduced to the computer networking field. The features and functions of microcomputer and network hardware components and devices will be covered. The majority of the lecture classes focus on the basic principles, concept sand terminology related to local area networks and wide are networks. The labs will provide students with hands-on experience with Windows and UNIX operating systems and network administration.

COMP C0924 WEB SERVER ADMINISTRATION

Administration of business class web service environments including server software and user applications. Administrative tasks performed include the installation and verification of software components, configuration of server and user environments, back and recovery routines, and the securing of sensitive content.

Prerequisite: COMP-10024 & (COMP-10041 or COMP-CO938)

ELEC 10034 NETWORK FUNDAMENTALS

Analyze the architecture, functions and components of the OSI and TCP/IP layered network models. Implement network topologies by applying basic principles of cabling and configuring network devices, including routers and switches. Analyze network standards, protocols, network operating systems, remote access and security. Implement IP addressing schemes. Configure, maintain, and troubleshoot local area networks.

ELEC 10045 ENGINEERING APPLICATIONS

This course focuses on software tools and resources encountered in Computer Engineering Technology. These are popular applications applied in a cross section of industries in which students may expect to be employed. The software packages are important tools that students will use to apply the fundamental skills and principles presented in the core courses of Computer Engineering Technology. Applications include Matlab, Labview and specified CAD packages. Students will use Matlab to evaluate complex mathematical problems. Labview is used to acquire and process signals via a DAQ board and implement MATLAB scripts. Students will also use AutoCAD or other similar software for schematic entry, board layout and perform electrical interconnect in accordance with rules to maximize circuit performance.

ELEC 10046 ENGINEERING PROJECTS 1

Students gain skills necessary to propose and complete a project. Students are guided through the process of completing a switch mode power supply as a project. During the project students learn and practice a variety of skills including researching technical information, organizing, planning, time management, sourcing components, designing circuits, using CAD programs to fabricate printed circuit board(s), and creating oral and written presentations. The final report from this course outlines students intended project to be completed in their last semester.

ELEC 10047 ROBOTICS & DIGITAL CONTROL

Students are exposed to 2 forms of computer controlled process automation. Students will be able to design and implement a digital controller for many types of processes. Examples of this are precisely controlling oven temperature, motion control and reducing energy costs associated with existing controls. Students will also be exposed to basic industrial robots and the common concepts in robot programming. A robotic arm will be programmed to perform common tasks including automated parts handling, inspection and assembly.

ELEC 10049 SERVER ADMINISTRATIONS

Apply Server technology in a network to provide data sources and network services. Investigate the operation of different data sources and network services found in networks. Build Server implementations to meet data source and network service requirements using the student's own versions of Microsoft Windows and Linux Server Network Operating Systems within a portable Virtual Server and Virtual Network environment.

ELEC 10050 INTERNET TECHNOLOGIES

Build, analyze, and test interactive web pages using client- and server-side scripting languages and environments such as JavaScript, VBScript, PHP and Active Server Pages through extensive hands-on projects revolving around actual business practices. Create dynamic web applications that interact with a database using scripts, and compiled server programs.

ELEC 10051 NTWRK DESIGN TROUBLESHOOTING

Analyze, configure, verify, and troubleshoot networks with various routing protocols. Implement VLANs, STP, VTP, and Inter-VLAN routing in a converged network. Configure a wireless network with latest network security. Design, install, operate, and maintain networks with routers and switches.

ELEC 10052 ADVANCED NETWORK TECHNOLOGIES

Explore integrated network services using Cisco Network Architecture. Select appropriate Wide Area Network (WAN) devices and technologies to meet network requirements. Implement and configure common WAN data link protocols and apply WAN security concepts, principles of traffic, access control, and addressing services. Detect, troubleshoot, and correct common enterprise network implementation issues using proper security and management tools.

ELEC 10053 INTERNET EMBEDDED SYSTEMS

Students will learn about and create a web server for a micro controller based embedded system. The required hardware and communication options will be explored. Issues unique to resource limited systems will be discussed along with general guidelines on implementation. Students will walk away with an embedded system hosting a web server able to manipulate the available inputs and outputs.

ELEC 10054 DIGITAL SIGNAL PROCESSING

This course review sampling theory AD and DA conversion, aliasing and frequency fold over. Sinusoids are developed from phasors to complex exponentials; frequency transformation and discrete notation are analyzed. Difference equations are determined and convolution and z-transformation is studied. FIR and IIR filters are designed and Pole-Zero Placement on the Unit Circle demonstrates Magnitude and Phase Response.

ELEC 10055 AUTOMATION & INDUSTRIAL NTWRKS

Automation and Networks Lab course provides the students with the knowledge and skills to configure and program a logic controller, HMI systems and industrial networks.

ELEC 10056 ENGINEERING PROJECTS 2

Students are given the opportunity to apply their knowledge gained in the previous semesters to complete a real project. Students must use a variety of skills including: researching technical information, organizing, time management, sourcing and costing components, designing and testing circuits, using CAD programs to draw circuits and generate layouts for printed circuit board(s), delivering an oral presentation to the resident Computer Technology student body and a formal written report. On completion of the project students will be well prepared to tackle projects in teams or on their own. Distinguished projects may be selected for display in the department and on the department website.

ELEC 10057 EMBEDDED SYSTEMS

This course focuses on embedded system design for real time applications. Development is extended from simple assembly programming under the AXIUM IDE to programming in C within the Code warrior IDE. Code portability is emphasized and software is designed for reuse in other applications. Flowcharting and other development technique are used to generate layered, modularized code in a bottom-up approach to project management. Real Time Operation systems are investigated and Kernel design is analyzed.

ELEC 10059 LINEAR SYSTEMS

Students are taught how to use math to model and predict the behaviour of various physical systems they will deal with on the job and in everyday life. Laplace transforms and ordinary differential equations form the main mathematical tools utilized. The course concepts are reinforced through application to electrical circuits, mechanical movement and temperature based systems. Students gain the skills required to predict how circuits and systems will respond to input signals and are prepared to proceed into feedback control systems. All sections of the course utilize Matlab and Simulink as a tool to explore the engineering systems.

ELEC 10060 ELECTRICAL ENG PROJECT1

This course gives the students an opportunity to complete a project related to the Electrical Engineering Technology Program. It will allow the student to apply knowledge gained during the previous semester and practice a variety of skills such as: researching for technical information, organization, planning, time management, looking up sources for components, designing and testing circuits, using CAD programs to draw circuits and generate layout for printed circuits board(s), and delivering oral and written presentations.

ELEC 10061 CONTROL SYSTEMS

This course covers the concepts and principles used to analysis and design of closed loop control systems, including analog and digital systems. The course will give the student an understanding of the mathematical techniques required for the representation of a real system, single-input single-output control systems. Various techniques will be used to study the performance of linear, continuous control and systems in both the time and the frequency domain. Basic methods of predicting and improving the time domain response of closed loop systems will be covered. Emphasis will be placed on design and analysis of various controllers. Students will also study the theory and implementation of controller using digital control system.

ELEC 10062 ADVANCED POWER SYSTEMS

This course will provide Electrical Control students with the skills required to handle various power devices such as relays, circuit breaker control devices, and other protective and control components. The course will also help the students to evaluate voltage control levels (under steady and fault conditions) and the performance of real and reactive energy flows. At the end of this course, the students will gain the practical experience needed to work for the industry and/or for power utilities (generation, transmission, distribution).

ELEC 10063 INDUSTRIAL ELECTRONICS & PLC

Use a controller to implement Grafcet, sequential function chart (SFC) and analog interfacing. Implement single and three phases' uncontrolled and controlled rectifiers using two and six pulse converters. Explore DC and AC drives and basic inverters and their applications.

ELEC 10064 ELECTRICAL ENG PROJECTS 2

This course is an expansion of the project related to the Electrical Engineering Technology Program which was started in the previous semester. The student will add on other functions to the project from the previous semester and will have more opportunity to practice a variety of skills such as: researching for technical information, organizing, planning, time management,

looking up sources for components, designing and testing circuits, using CAD programs to draw circuits and generate layout for printed circuit board(s), and delivering oral and written presentations.

ELEC 10065 VARIABLE SPEED DRIVES

This course covers concepts and principles to describe, analyze and evaluate variable speed drives. Closed loop control systems for current, voltage, speed and positions in motor drive applications will be studied. This will be achieved using several types of drive systems, such as D.C motors and 3-phase AC motors. Emphasis will be placed on the calculation of system settings, component rating, testing and trouble shooting procedures. In particular, detailed study and evaluations will be carried out using the Allen Bradley 1395 digital D.C drive system, the Galil multiple axis digital motion control system and the ABB ACS 800 variable speed AC drivers.

ELEC 10066 INSTRUM & PROCESS CONTROL

This course covers concepts and principles to describe, analyze and evaluate input and output signals for many common pressure, level, temperature and flow measuring systems, and correctly select (making necessary analysis and calculations) pressure, level and temperature measuring devices given the process conditions. He/she should also be able to design, construct, test and tune a control loop using a PI controller.

ELEC 10067 POWER PROTECTION & MGMT

This course covers concepts and principles to describe, analyze and evaluate power system economics and management; fault prediction and management; real time protection and control of power systems; economics dispatch, optimal power flow, power quality problems and mitigation methods.

ELEC 10072 WIRELESSES & OPTICAL CONNUNCATION

Wireless and Optical Communications investigates communication techniques employed in power distribution and management systems. The fiber optic portion of the course addresses optical fiber, components, installation, testing, and system design. The wireless portion of the course focuses on transmission lines, waveguides, microwave devices and antennas.

ELEC 10083 ELECTRICAL POWER GENERATION

The objective of this course is to familiarize the students with the basics of power generation technologies and their associated electrical components. Students are expected to understand various types of power plants, examine plant operation, identify plants' major electrical components (transformers, motors, breakers, synchronous machines, etc.), and recognize components' specifications. The concepts of Distributed Generation (DG) and Feed-in Tariff (FIT) schemes will also be covered. As well, the students will be introduced to Power Flow Program, Power World Simulator, and RETScreen Software. Based on Ontario Hydro system, the Power Flow Program and Power World Simulator will help the students to evaluate the performance of real and reactive energy flows. The RETScreen software will help students to evaluate a wide range of renewable and conventional energy sources including: wind; hydro; solar, biomass; biodiesel; biogas; natural gas; oil/diesel; coal; etc. Furthermore, the RETScreen

software will also help students to understand and apply the FIT and Micro-Fit schemes to various energy systems.

ELEC 10084 SMART METERING & DISTRIBUTION

Become familiar with the concepts of power and energy measurements in single phase and three phase systems. Learn the principles of electromechanical and digital instruments and use the phasor diagrams to develop metering connections typical for substation operation and switchboard metering. Review smart grids and smart meters and the communication networks necessary for time-of-use pricing.

ELEC 10087 ENGINEERING SKILLS 1

Introduce the basic hand and power tools, components and fabrication techniques encountered by the technician/technologist. The student is also introduced to the use of meters and oscilloscopes for electronic measurements, use of electrical safety code book, identify common electrical hazards around workplace, the general safe working practices for installing or repairing electrical equipment.

ELEC 10088 ELEC ENG DRAFTING & DESIGN 1

Outline drafting standards involved in creating drawings for residential, commercial and industrial applications. Apply standard drafting techniques to produce drawings of electrical and electronic systems as well as two-dimensional electrical drafting using CAD software.

ELEC 10095 DIGITAL PRINCIPLES

Explore the basic concepts of digital logic circuits. Design and construct basic logic circuits using current digital integrated circuits.

ELEC 10099 ELECTRICITY 1

This course introduces students to electrical units, voltage, current, resistance and power. DC circuit analysis is studied including Ohms Law, Kirchoffs voltage and current laws, Series and Parallel circuits, Network Theorems and Capacitance.

ELEC 10100 ELECTRONIC DEVICES

This introductory course in electronic devices is intended to introduce students to various discrete semiconductor components. The student shall be able to describe the functions of each device, its major characteristics and solve circuits using these devices in terms of D.C. and A.C. conditions.

ELEC 10101 ELECTRICITY 2

This introductory course in electronic devices is designed to introduce the student to various discrete semiconductor components. The student shall be able to describe the functions of each device, its major characteristics and solve circuits using these devices in terms of D.C. and A.C. conditions.

ELEC 10102 ADVANCED SERVER TECHNOLOGIES

Provides a technical overview of the UNIX/LINUX operating system. Topics include in-depth experiences in the details of Linux installation, file system operation and management, system initialization, graphical user interfaces and process management. It also addresses common administration tasks, system backup operations, software installation and performance tuning. Students will learn how to install, maintain, monitor, and troubleshoot a Linux system.

Prerequisites: ELEC 10100 Electronic Devices and MATH 10021 Engineering Mathematics 2

ELEC 10103 DIGITAL SYSTEMS

Digital Systems extends the concepts studied in Digital Principles to include sequential circuits, memory systems, buses and microcontroller architecture. Students will program the ATmega169 in assembly language to drive applications including LCD's, Timers and ADC's. They will build systems to measure voltage, generate waveforms, display messages and control small systems.

ELEC 10104 ELECTRONIC CIRCUITS

A course in the fundamental theory of basic semiconductor devices consisting of diodes, special diodes, bipolar and field effect transistors with an introduction to Fibre Optic transmission. The application of these devices in power supplies, amplifiers is covered. A course in the fundamental theory of basic semiconductor devices consisting of diodes, special diodes, bipolar and field effect transistors with an introduction to Fibre Optic transmission. The application of these devices in power supplies, amplifiers is covered.

Prerequisite: ELEC 10081

ELEC 10106 NETWORK SECURITY & MANAGEMENT

Install, troubleshoot, and monitor network devices to maintain the integrity, confidentiality, and availability of data and devices. Administer devices and applications in a secure infrastructure, recognizing network vulnerabilities, and mitigate security threats. Design, implement, and manage network security using a comprehensive security policy.

Prerequisite: ELEC 10052

ELEC 10109 ELECTRONIC DEIGN AUTOMATION

Explore integrated network services using Cisco Network Architecture. Select appropriate Wide Area Network (WAN) devices and technologies to meet network requirements. Implement and configure common WAN data link protocols and apply WAN security concepts, principles of traffic, access control, and addressing services. Detect, troubleshoot, and correct common enterprise network implementation issues using proper security and management tools.

ELEC 10110 ELECTRICAL MACHINES

Examine various types of electrical machines; outline the construction and performance of motors and generators (ac and dc).

ELEC 10111 INTRODUCTION TO POWER SYSTEMS

The course will provide a foundation in three phase systems, distribution systems, transformers, power measurement, power factor correction, current transformers and potential transformers.

ELEC 10112 INDUSTRIAL AUTOMATION

Demonstrate knowledge of transformers, three-phase electrical systems, electric machines and programmable logic controllers (PLC's).

ELEC 10113 ELEC ENG DRAFTING & DESIGN 2

Interpret, analyze and generate detailed drawings for electrical and industrial applications using CAD software with emphasis on the design elements of electrical energy transmission systems and substations. Distinguish between types of electrical drawings, substation layouts and protection schemes. Demonstrate correct use of engineering equipment designations and electrical engineering CAD drafting standards

ELEC 10118 COMPUTER HARDWARE & SOFTWARE

Use the basic hardware components and operating system software of Wintel (Microsoft Windows-Intel) compatible computer systems, including installation/configuration. Acquire a major portion of the knowledge required to write Compton's A+ Certification examinations (A+ Core Hardware exam and the A+OS Technologies exam). Go through Cisco System's IT Essentials1 course offered through the Cisco Networking Academy Program.

ENRG 10000 INTRO CLEAN & RENEWABLE TECHNL

Examine clean and renewable technologies such as nuclear, wind, solar and geothermal, emphasizing scientific principles and practical conversion applications as well as the economic, environmental and political aspects of energy production.

ENRG 10001 CLEAN & RENEWABLE TECHNOLOGY 1

Examine various clean and renewable technologies and their applications. Trends in the RE industry are considered, particularly with regard to costs, industry growth and technology innovation. Apply chemistry and physics pertaining to specific technologies.

ENRG 10002 CLEAN & RENEWABLE TECHNOLOGY 2

Examine various clean and renewable technologies and their applications. Trends in the RE industry are considered, particularly with regard to costs, industry growth and technology innovation. Apply chemistry and physics pertaining to specific technologies.

ENRG 10003 CAPSTONE PROJECT 1

Apply skills and knowledge to a real-world problem relevant to clean and renewable energy technology. Practice effective management of the project and the team process.

ENRG 10004 ENERGY MANAGEMENT

Evaluate the energy use patterns for residential, small-scale industrial and commercial buildings and recommend energy efficiency and alternative energy solutions for high energy consuming buildings. Relate supply-side energy management concepts and practices with demand-side

energy management. Describe various methods of energy conservation and associated mechanical services installations. Perform the necessary tests and data collection procedures for a complete energy audit and analysis of residential, small-scale industrial or commercial buildings.

ENRG 10005 CLEAN & RENEWABLE TECHNOLOGY 3

Examine various clean and renewable technologies and their applications. Trends in the RE industry are considered, particularly with regard to costs, industry growth and technology innovation. Apply chemistry and physics pertaining to specific technologies.

ENRG 10006 GREEN BUILDING DESIGN & LEED

Review the Leadership in Energy and Environmental Design (LEED) credit system. Identify objectives of sustainable building sites with a systematic view of green building, sustainability and low-impact development.

ENRG 10007 ENERGY ENTREPRENEURSHIP

Contribute to successful completion of a project by utilizing project management processes and practice skills related to project integration, scope, time, cost, quality, human resources, communications, risk, and procurement management.

ENRG 10008 CAPSTONE PROJECT 2

Apply skills and knowledge to a real-world problem relevant to clean and renewable energy technology. Practice effective management of the project and the team process.

ENRG 10009 ENERGY CONVERSION & INTEGRATN

Explain the transfer and conversion of energy in devices and systems. Describe ways to integrate emerging and alternative energy sources to power mechanical devices Design and construct devices and systems that use one or more energy sources.

ENRG 10010 CLEAN & RENEWABLE TECHNOLOGIES 4

Examine various clean and renewable technologies and their applications. Trends in the RE industry are considered, particularly with regard to costs, industry growth and technology innovation. Apply chemistry and physics pertaining to specific technologies.

LAWS 10081 SMART REGULATIONS

Apply key legislation and regulations to the clean and renewable energy industry.

MATH MA179 ENGINEERING MATHEMATICS 1

A basic mathematics course covering the following topics: Algebra, trigonometry, complex numbers, logarithms, exponential and logarithmic functions, systems of linear equations, sine and cosine waves.

MATH 10014 ENGINEERING MATHEMATICS 3

The course covers the following: Review of differentiation & Integration, First and Second Order Differential Equations, Application in Circuit Problems, Laplace Transforms, and Laplace Transform Method for Solving Differential Equations, z-transforms, Fourier series

MATH 10021 ENGINEERING MATHEMTICS 2

An introduction to Functions, Graphs, Straight Line, Quadratic Equations, Analytic Trigonometry, Empirical Equations, Differential and Integral Calculus.

MATH 10042 MATH FOR COMPUTER STUDIES

This course is an introductory math course for computer students, which cover the following: Binary, Octal, Decimal and Hexadecimal Number Systems, Boolean algebra including Truth Tables and Boolean Laws, Computer Arithmetic, Graphing, and Basic Algebra and Mathematics Review.

MATH 10051 DISCRETE MATH & STATS

This course introduces students to selected topics from discrete mathematics, number theory, and statistics. Discrete mathematics topics include: progression and sequences; mathematical induction; and binomial theorem, permutations and combinations. Number theory topics include: understanding data; gathering data; probability and probability models; inference about data; and analysis.

Prerequisite: MATH 10042

MGMT 10008 PROJECT MANAGEMENT FOR IT

Project Management as it applies to Information Technology. A fundamental understanding of Project Management methodologies according to the Project Management Institutes PMBOK, (Project Management Body of Knowledge). A hands-on case study using Microsoft Project, modules include scheduling, scope, budgeting, risk assessment, critical path and resources.

MGMT 10095 PROJECT MANAGEMENT

Students will learn project management as it pertains to Electrical Technology. Modules include: Framework, Scope, Time, Communications, Human Resources, Cost, Quality, Risk, and Procurement. Microsoft Project is used to develop project plans in a hands-on case study.

OPEL XXXXX GENERAL EDUCATION 1 OPTION TABLE

OPEL XXXXZ GENERAL EDUCATION 2 OPTION TABLE